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EXAMINER	
KIM, CHONG HWA	

ART UNIT	PAPER NUMBER
3682	

NOTIFICATION DATE	DELIVERY MODE
01/11/2008	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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## Office Action Summary

Application No.

10/743,458

Applicant(s)

KUBOTA ET AL.

Examiner

Chong H. Kim

Art Unit

3682

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12, 14-20 and 22-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-20 and 22-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/27/07 has been entered.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the different shapes of valley as recited in claims 16-20 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. (Note: the drawings are objected because the independent claim recites that the groove has a pair of parallel walls with an arc which reads on Figs. 6A and 6B. Claims 16-20 read on Figs. 9-13. However, Figs. 9-13 do not show parallel walls.)

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must

be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 7-12, 14, 15-20, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukai et al., U.S. Patent 4,693,139.

Mukai et al. shows, in Figs. 1-6, an engine having a split type connecting rod, the connecting rod comprising: a crank-pin hole (see Fig. 1); a valley 112, 122 formed on an inner circumferential surface 7 of the crank-pin hole; a fracture starting point groove 111, 121 formed at the base portion of the valley; wherein a width of the fracture starting point groove is less than a width of the valley (see Fig. 6); wherein the split type connecting rod is a nut-less type of connecting rod that is made of a forged material (col. 3, line 8); further comprising a small end portion 1 and a large end portion 2, wherein the large end portion includes the valley and the

fracture starting point groove is formed in the large end portion; further comprising a rod portion 3 and a cap portion 2 sub 2; wherein a pair of the fracture starting point grooves are formed on the inner circumferential surface of the crank-pin hole; wherein an angle relative to a predetermined fracture plane passing from a shaft center of the crank-pin hole through a bottom portion in a bottom surface of the pair of fracture starting point groove and the valley is approximately 45 degrees (see Fig. 6 and col. 3, lines 36-47); wherein an interior angle of the valley is approximately 90 degrees (see Fig. 6 and col. 3, lines 36-47); wherein a cross section of the valley is larger than a cross section of the fracture starting point groove (see Fig. 6); wherein the bottom surface of the groove includes a bottom surface forms an arc with a radius (Fig. 6); and wherein the valley includes a pair of sloped portions 112, 122; but fails to show the surfaces of the groove being parallel to the fracture plane, different shapes of the valley surface as recited in claims 16-20, the ratio  $H/R$ , and a vehicle.

It would have been an obvious matter of design choice to make the surfaces of the fracture starting point groove of Mukai et al. parallel to the fracture plane, since such a modification would have involved a mere change in the shape of the groove. A change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). Furthermore, a discovery of optimum range within prior art general conditions is also generally recognized as being within the level of ordinary skill in the art. *In re Aller et al.*, 105 USPQ 233.

As to the matter of the shapes of the sloped portions of the valley, it would have been an obvious matter of design choice to make the shape of the sloped portions of the valley of Mukai et al. with either curved, swelled and rounded, concaved, or rectilinear shape, since such a

modification would have involved a mere change in the shape of the valley. A change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

As to the matter of the ratio H/R being between 1 to 10, it would have been obvious matter of design choice to provide such range in Mukai et al. A discovery of optimum range within prior art general conditions is generally recognized as being within the level of ordinary skill in the art. *In re Aller et al.*, 105 USPQ 233

As to the matter of the connecting rod being used in a vehicle, it would have been obvious to a person of ordinary skill in the art to apply the connecting rod as disclosed by Mukai et al. in a vehicle since it is well known in the art of engine that the connecting rod of Mukai et al. is made for engine and usually the engine is used in vehicles.

5. Claims 1-3, 7-12, 14, 15-20, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spurny, U.S. Patent 6,125,536.

Spurny shows, in Figs. 1-5, a split type connecting rod comprising: a crank-pin hole 9; a valley D formed on an inner circumferential surface of the crank-pin hole; a fracture starting point groove 13 formed at the base portion of the valley and includes a bottom surface forms an arc with a radius (Fig. 3); wherein a width of the fracture starting point groove is less than a width of the valley; wherein the valley is formed such that the base portion is located at a position where a ratio of a depth of the fracture starting point groove to a shortest distance from an opening of the fracture starting point groove to a bolt hole 11 (as measured at the mid-portion of the valley D in Fig. 2) is about 70% or more; wherein the split type connecting rod is a nut-less type of connecting rod that is made of a case material (see Abstract); further comprising a

small end portion 1 and a large end portion 5, wherein the large end portion includes the valley and the fracture starting point groove is formed in the large end portion; further comprising a rod portion 3 and a cap portion; wherein a pair of the fracture starting point grooves are formed on the inner circumferential surface of the crank-pin hole; wherein a cross section of the valley is larger than a cross section of the fracture starting point groove; and wherein the valley includes a pair of sloped portions; but fails to show the surfaces of the groove being parallel to the fracture plane, the surface of the valley being about 45 degrees measured from the fracture plane, different shapes of the valley surface as recited in claims 16-20, and the ratio H/R, and a vehicle.

It would have been an obvious matter of design choice to make the surfaces of the fracture starting point groove of Spurny parallel to the fracture plane and the interior angle of the valley having 90 degrees, since such a modification would have involved a mere change in the shape of the groove or the valley. A change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). Furthermore, a discovery of optimum range within prior art general conditions is also generally recognized as being within the level of ordinary skill in the art. *In re Aller et al.*, 105 USPQ 233.

As to the matter of the shapes of the sloped portions of the valley, it would have been an obvious matter of design choice to make the shape of the sloped portions of the valley of Spurny with either curved, swelled and rounded, concaved, or rectilinear shape, since such a modification would have involved a mere change in the shape of the valley. A change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

As to the matter of the ratio H/R being between 1 to 10, it would have been obvious matter of design choice to provide such range in Spurny. A discovery of optimum range within prior art general conditions is generally recognized as being within the level of ordinary skill in the art. *In re Aller et al.*, 105 USPQ 233

As to the matter of the connecting rod being used in a vehicle, it would have been obvious to a person of ordinary skill in the art to apply the connecting rod as disclosed by Spurny in a vehicle since it is well known in the art of engine that the connecting rod of Spurny is made for engine and usually the engine is used in vehicles.

6. Claims 1, 2, 4-12, 14-20, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al., U.S. Patent 6,312,159 B1 in view of Mukai et al.

Ishida et al. shows, in Figs. 1, 2, and 7, an engine (col. 1, line 17) having a split type connecting rod, the connecting rod comprising: a crank-pin hole 1d; a fracture starting point groove 21; further comprising a bearing locking groove 5a, 5b, 6a, 6b provided on the inner circumferential surface of the crank-pin hole, wherein the valley is formed at a position opposite to the bearing locking groove provided on the inner circumferential surface of the crank-pin hole; wherein the bearing locking groove includes a pair of concave portions located at positions that are deviated in the circumferential direction of the inner circumferential surface of the crank-pin hole; wherein the split type connecting rod is a nut-less type of connecting rod that is made of a cast material (die-formed); further comprising a small end portion 1b and a large end portion 1a, wherein the large end portion includes the fracture starting point groove is formed in the large end portion; further comprising a rod portion 1c and a cap portion 3; and wherein a pair of the



fracture starting point grooves are formed on the inner circumferential surface of the crank-pin hole; but fails to show the surfaces of the groove being parallel to the fracture plane, a valley having surfaces positioned about 45 degrees measured from the fracture plane, different shapes of the valley surface as recited in claims 16-20, and the ratio H/R, and a vehicle.

Mukai et al. shows, in Fig. 6, a split type connecting rod comprising a valley 112, 122 formed on an inner circumferential surface 7 of the crank-pin hole; a fracture starting point groove 111, 121 formed at the base portion of the valley; wherein a width of the fracture starting point groove is less than a width of the valley (see Fig. 6); wherein an angle relative to a predetermined fracture plane passing from a shaft center of the crank-pin hole through a bottom portion in a bottom surface of the pair of fracture starting point groove and the valley is approximately 45 degrees (see Fig. 6 and col. 3, lines 36-47); wherein an interior angle of the valley is approximately 90 degrees (see Fig. 6 and col. 3, lines 36-47); wherein a cross section of the valley is larger than a cross section of the fracture starting point groove (see Fig. 6); and wherein the valley includes a pair of sloped portions 112, 122.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the shape of the fracture starting configuration of Ishida et al. by providing the valley as taught by Mukai et al. in order to effectively prevent the damages or generating cut power on the reverses of the split metals, as described from col. 3, line 48 to col. 4, line 3 by Mukai et al.

As to the matter of the shapes of the sloped portions of the valley, it would have been an obvious matter of design choice to make the shape of the sloped portions of the valley of Mukai et al. with either curved, swelled and rounded, concaved, or rectilinear shape, since such a

modification would have involved a mere change in the shape of the valley. A change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

As to the matter of the surfaces of the groove having a surface that is parallel to the fracture plane, it would have been an obvious matter of design choice to make the angle of fracture starting point groove of Ishida et al. parallel to the fracture plane, since such a modification would have involved a mere change in the shape of the groove. A change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). Furthermore, a discovery of optimum range within prior art general conditions is also generally recognized as being within the level of ordinary skill in the art. *In re Aller et al.*, 105 USPQ 233.

As to the matter of the bottom surface of the groove having an arc shape, it would have been obvious to make the sharp bottom groove with a rounded surface since it is a common knowledge that a fracture starting point can be easily made from either rounded surface or sharp indented surface and such method would be within the level of ordinary skill in the art.

As to the matter of the ratio H/R being between 1 to 10, it would have been obvious matter of design choice to provide such range in Mukai et al. A discovery of optimum range within prior art general conditions is generally recognized as being within the level of ordinary skill in the art. *In re Aller et al.*, 105 USPQ 233

As to the matter of the connecting rod being used in a vehicle, it would have been obvious to a person of ordinary skill in the art to apply the connecting rod as disclosed by Ishida

et al. in a vehicle since it is well known in the art of engine that the connecting rod of Ishida et al. is made for engine and usually the engine is used in vehicles.

***Response to Arguments***

7. Applicant's arguments with respect to claims 1-12, 14-20, and 22-24 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chong H. Kim whose telephone number is (571) 272-7108. The examiner can normally be reached on Monday - Friday; 9:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571) 272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

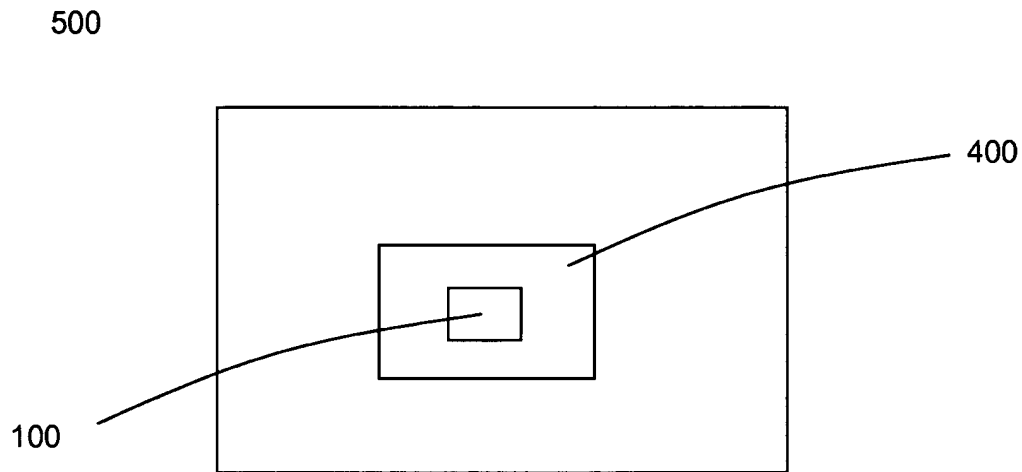
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chk  
January 7, 2008

  
CHONG H. KIM  
PRIMARY EXAMINER

New Sheet

**Figure 19**



OK to enter, Ch